

from Nye County, Nevada. From C. D. Gibbes, four specimens of coal from Australia, Nanaimo and Mt. Diablo.

W. N. Lockington read the following:

Notes on some California Marine Fishes, with Description of a New Species.

BY W. N. LOCKINGTON.

Mr. W. J. Fisher, formerly Librarian of this institution, is now engaged in collecting objects of Natural History on the coast of Lower California. I have up to this period received two consignments from him, consisting of skins of birds and mammals, shells, crustacea, and a few reptiles and radiates.

As the Academy kindly assisted us by furnishing alcohol, and as we wish to do our best to make the collection in this building a complete one as regards Californian species, we shall from time to time, as we are able to identify and describe them, present specimens of such forms as are not in its possession.

The work of identifying is necessarily slow, and our time limited. It is intended for the future to furnish notes with the specimens presented—fishes, crustacea, etc. Our time has hitherto been occupied entirely with the fishes and crustacea.

Among the former are two or three forms which I believe to be new, and several others which are not brought into our markets, although they have been described by Ayres or Girard, and range as far north as San Francisco Bay.

We present this evening specimens of such of these as we have been able to identify or describe, and the greater part of these notes relates to the specimens presented.

Mr. W. G. W. Harford, who has assisted me greatly, has himself taken most of the measurements given in this paper.

Albula conorhynchus. Gunther.

Among the fishes forwarded to us, the only soft-finned ones were two beautiful specimens of about the size of a mackerel, glowing with gold upon the sides, and with darker metallic reflections upon the back, the prevailing tint, however, especially below, being that of burnished silver.

I should have believed them to be fresh water fish had I not known that everything from the waters yet sent by Mr. Fisher was marine. Unfortunately the label attached was so injured by the alcohol that it was lost in unpacking.

The structure of the teeth, however, proved the fish to be no cyprinoid, and the absence of an adipose fin "counted out" the salmon and other families. One of the clupeoid or herring family, therefore, it must be, both by its structure and its marine habitat. Yet it seemed a very singular herring, with its rounded abdomen (the herrings mostly have a sharp abdomen)

and the curious yellow gelatinous membrane, which covered the eyes so as to leave no outward trace of the orbit.

On examining the genera and species of clupeoids given in Dr. Gunther's valuable catalogue, I found, however, one species, the only one of its genus, and this the only one of its tribe, characterized, among other things, by a flat abdomen (which I take to mean not sharp as in the rest of the family), and an "adipose membrane covering the eye." I therefore concluded that my fish was an example of that singular species, and my belief was strengthened by the close agreement of all the other characters, as the number of fin rays, position of mouth, teeth, etc.

The only difference I noted was in the color, which Gunther gives as "uniform silvery," but it must be remembered that these specimens were much fresher than Gunther's could be; and the much greater prevalence of the gold and dark metallic reflections in one of the specimens than in the other, appears to show that the tints are variable. This point I hope to settle ere long, by the aid of Mr. Fisher.

Following are the dimensions of one of the specimens:

	<i>Inches.</i>
Length.....	3.7
Length of head.....	3.5
Length of base of dorsal.....	2.5
Tip of snout to origin of dorsal.....	6.
Length of caudal.....	3.
Tip of snout to base of anal	8.
Girth in thickest part, just in advance of dorsal ..	7.

This species has been found in the Atlantic and Indian Oceans, and one of Gunther's specimens was from the Pacific Coast of Central America, but I do not find that it has previously been reported from the North Pacific.

Argyreus Pacificus, n. sp.

Greatest height of dorsal outline, immediately behind the eye; greatest depth of body, immediately in front of anal. Proportion of length to greatest depth, about as 7 to 15. Lower jaw longer than upper. None of the rays of spinous dorsal elongated. First three rays of soft-dorsal very long, next two decreasing, the remainder nearly equal. No free spines in part of anal. First articulated ray of anal much elongated. First three rays of soft-dorsal undivided, the others much branched. Membrane between rays of anal very short, rays much branched, except the first, so that the anal appears to consist of many finlets, especially when depressed. Dentition and branchiostegals, normal. Pectorals very long, one-third the total length of the fish. Fourth, fifth and sixth rays (counting downwards) the longest. Ventrals very short and small. Dorsal outline depressed behind snout, then nearly perpendicular to above posterior edge of orbit, thence almost straight to origin of soft dorsal, thence rounded and rapidly narrowing to peduncle of tail. Caudal lobes very long and narrow. The greatest thickness of the fish is between the eyes and the base of the pectorals. Formula of fins: D, 4 or 5, $\frac{1}{2}$; A, $\frac{1}{9}$; P, $\frac{1}{8}$; V, $\frac{1}{5}$.

Numerous specimens of this species caught in Magdalena Bay have been examined by us, and careful comparison with the forms described in Gunther's catalogue has led me to the conclusion that this is a new species. From *A. vomer* it differs in the extreme shortness of its ventrals, none of the rays of which, or of the spinous dorsal, are continued into filiform prolongations; also, in the greater proportional length of the pectorals. From *A. setipinnis* it can be at once distinguished by the prolongation of the first rays of the soft dorsal and the anal.

The dimensions of a large specimen are as follows:

	Inches.
Extreme length in straight line from the tip of lower jaw to tip of lower lobe of tail.....	15.5
Extreme height in front of anal fin.....	7.2
Height immediately behind eye.....	6.65
Greatest girth.....	14.60
Length along profile from tip of lower jaw to origin of soft dorsal.....	10.60
Length from tip of lower jaw to origin of anal.....	6.75
Length of base of soft dorsal.....	5.60
Length of base of anal.....	5.50
Length of base of pectorals.....	.62
Length of head above orbit.....	3
Length of pectorals.....	5.45
Length of ventrals.....	.5
Length of caudal to division of lobes.....	2.25
Length of lower lobe of caudal from fork.....	3.40
Length of upper lobe of caudal from fork.....	2.95
Length of longest ray of dorsal.....	4.10
Length of longest ray of anal.....	3
Length of lower jaw.....	1.8
Distance from tip of lower jaw to orbit.....	2.65
Diameter of orbit.....	.75
Greatest thickness of fish.....	1

One or two specimens exceeded these dimensions.

Cestracion francisi. Grd. U. S. P. R. R. Rep., vol. x, p. 365.

Of this genus of sharks, so interesting from its occurrence in geological time as far back as the Devonian Age, only four species now exist; one of these, *C. phillipi*, is the often-mentioned Port Jackson shark; another, *C. francisi*, has been caught in the Bay of Monterey, and occurs along the coast at least as far south as Magdalena Bay, Lower California, from which place we received a single fine specimen, the dimensions of which are appended:

	Ft.	In.
Length from tip of snout to tip of caudal.....	2	6½
Length from tip of snout to origin of first dorsal.....		8⅞
Length from origin of first dorsal to origin of second dorsal...		8½
Circumference immediately in front of first gill-opening.....	1	1¼
Circumference immediately in front of pectorals.....	1	1¾

Circumference immediately behind first dorsal.....	11
Circumference immediately in front of second dorsal.....	6 $\frac{1}{8}$
Distance from tip of snout to eye.....	2 $\frac{3}{4}$
Longitudinal diameter of eye.....	$\frac{5}{8}$
Breadth between supra-ocular ridges.....	2 $\frac{1}{4}$
From spiracle to tip of snout.....	3 $\frac{1}{4}$
Length of pectorals along anterior edge.....	7
Height of first dorsal spine.....	2 $\frac{1}{8}$
Length of base of first dorsal.....	2
Length of base of second dorsal.....	2 $\frac{1}{2}$
Length of claspers from opening of anus.....	4 $\frac{1}{8}$
From anus to tip of snout.....	1 1 $\frac{3}{4}$
Width between angles of mouth.....	3 $\frac{1}{4}$

Trachynotus ovatus? Gunther.

Among our fish were several specimens which appeared to agree in every respect with Girard's genus *Doliodon* (*Trachynotus*, Gunther), and to be very near the species named by him *Doliodon carolinensis*.⁹ A comparison of proportionate dimensions, however, induces me to consider it as belonging to the long-known species *T. ovatus*, which has previously been found in almost every sea from the east coast of North America to the shores of Australia. The dorsal spines are, one directed forward, six with membrane attached, and one at origin of soft dorsal. The principal measurements of the specimen presented are as follows:

	Inches.
Extreme length.....	11.62
Extreme depth from dorsal to anal.....	5.12
From tip of upper jaw to tip of first dorsal spine, following outline.....	4.0
Thence to origin of soft dorsal.....	1.75
Length of base of soft dorsal.....	3.25
Length of vase of anal.....	3.0
Length of vase of pectorals.....	0.5
Length of pectorals.....	2.12
Length of ventrals.....	0.95
Greatest girth.....	10.62
Girth at base of pectorals.....	8.5
Length of head.....	2.75
From orbit to tip of upper jaw.....	0.55
Diameter of eye.....	0.60
Greatest thickness of body between eye and pectorals.....	1.25

One of the specimens was at least one-third larger in every dimension.

Paralabrax nebulifer. Grd. P. R. R. R., x, p. 33, pl. xii, fig. 1-4.

This species does not, so far as I know, occur near this vicinity, as I have not yet detected it in the market. We have several specimens from San Bar-

tolome Bay, Lower California, where they were taken among kelp. The largest specimen measures as follows:

	<i>Ft.</i>	<i>In.</i>
Extreme length	1	5½
From snout to posterior edge of operculum		5½
Base of dorsal fin.....		7½
Base of spinous portion of fin.....		3½
Circumference in front of pectorals.....		10½
From snout to origin of dorsal.....		5½
From snout to origin of anal.....		11
Length of pectorals.....		3½
From snout to origin of pectorals.....		5 7/10
Length of ventrals.....		3

Triakis semifasciata. Gunth. (*Mustelus felis.* Ayres.)

This is one of the commonest sharks of San Francisco and Tomales bays, and is also found on the coast of Lower California. Ayres described it as a *Mustelus*, but its teeth, though somewhat pavement-like, and, in many cases, have points or cusps, whereas in *Mustelus* they are wholly smooth. Both this species and *Mustelus Californicus*, Gill, are commonly called "dog-fish," but, though from their small size, they resemble the real dog fish or *Scylliæ*, they differ from them greatly in their teeth, and in the absence of a nictitating membrane to the eye. A large specimen, procured in this bay, measured as follows:

	<i>Ft.</i>	<i>In.</i>
Tip of snout to end of tail.....	4	3
Tip of snout to origin of first dorsal.....	1	3
Origin of first dorsal to origin of second.....	1	4
Length of base of second dorsal ...		4.5
Greatest length of pectorals		8
Length of head on back.....		8
From anterior margin of lower lip to origin of anal.....	1	10
Snout to anterior margin of lower lip.....		3.25
Greatest circumference at origin of anterior dorsal.	1	6

Mustelus Californicus. Gill.

This is the common "dog-fish" of San Francisco Bay. It does not usually attain the dimensions of the species last named, and is easily distinguished from that prettily marked species by its plain uniform slaty hue, becoming whitish beneath.

Semicossyphus pulcher. Gunther. (*Labrus pulcher.* Ayres.)

This fish was the first of the sixty-eight Californian species described by Dr. W. O. Ayres, and its description forms the first page of the first volume of the proceedings of this Academy. The smaller number of spinous rays in dorsal, the presence of a posterior canine tooth, and the absence of scales on

the pre-operculum, do not allow of its classification in the genus *Labrus*, and Dr. A. Gunther considers those peculiarities sufficiently marked to warrant the formation of a new genus for its reception. Fortunately for us, we have a very full series of specimens; had it not been for this, the extreme forms would certainly be considered distinct species. Not only the coloration, but the form of the head, varies greatly, but the variations will be found, on comparison of a number of specimens, to shade into each other, and the extreme forms are found along with each other among the floating kelp. Some of the specimens were taken at a depth of eight fathoms, but still near kelp. A label attached to a highly colored specimen gives the following particulars of the colors when fresh:

"Iris golden, with a red rim; head to pectorals black, including upper jaw; lower jaw white. Pectorals, ventrals, caudal and dorsal, black. Body from head to a perpendicular from behind anus, deep red, shading into light red under belly. From anus to end of caudal, black."

One of the largest specimens measured as follows:

	<i>Ft.</i>	<i>In.</i>
Total length.....	1	6
Base of dorsal fin.....		7.1
Height of soft dorsal.....		3.5
Length of spinous portion of dorsal.....		5
Length of base of anal.....		3.5
Height of anal.....		2.5
Length of base of ventral.....		1
Length of ventral.....		3
Greatest depth of body, at origin of soft dorsal.....		5.5
Greatest girth at origin of soft dorsal.....	1	1'
Length of tail.....		3
End of snout to origin of dorsal, following the outline.....		6.5

Sphyræna argentea. Grd.

Of this rare species one large specimen and three smaller have been sent to us. The largest measured as follows:

	<i>Ft.</i>	<i>In.</i>
Extreme length.....	2	10.5
From tip of lower jaw to posterior edge of operculum.....		9
Base of first dorsal.....		2.6
Tip of lower jaw to origin of first dorsal.....	1	1.2
Base of second dorsal.....		2.6
Tip of lower jaw to origin of second dorsal.....	1	9.5
Length of tail.....		5.2
Girth in front of pectorals.....		8.4
Tip of lower jaw to anterior rim of orbit.....		4
Diameter of orbit.....		1.1

C. W. Kreuger was introduced by Mr. Troyer and delivered a lecture on "Flying Machines," exhibiting and explaining at the same time a model of a flying machine of his own invention.